

Achieving “Seamless” Release to Manufacturing (RTM)

Optimizing the RTM process is Critical to Successful Product Development

The days of casually ‘throwing the product design over the wall’ to manufacturing are over. By seamlessly connecting engineering with downstream ERP systems, companies can reduce late-stage design changes and their detrimental costs. This brief whitepaper describes the proper steps for optimizing your release to manufacturing process in order to improve your competitive edge.

When you consider the activities that take place in release to manufacturing—multiple changes to the product, control of enterprise-wide data exchange, resource management across the value chain, control of milestones and schedules—it's not surprising that this process causes many sleepless nights for manufacturing managers. Yet, in today's intensely competitive business environment, the typical release to manufacturing process simply doesn't cut it anymore. There's a better way to manage this crucial process, and it's easier than most manufacturers imagine.

Understanding the Challenges

As a rule, engineering and manufacturing are separate organizations within a company. And while this makes sense, the separation of power often means limited communication and collaboration between functional groups. Despite the hard work and best intentions of IT managers and internal application developers charged with integrating ERP systems with product development, the release to manufacturing process hasn't improved much in recent years.

Even today, many release to manufacturing activities still require tremendous ongoing administrative attention. Individuals are still forced to reproduce information from their product data management system and enter it into another system that manufacturing is using for production planning. This manual data entry is not only expensive and time-consuming, but it also introduces errors that can be easily avoided. Additionally, these manual processes do not scale proportionally to volume, and thus can't handle the varying information demands throughout a product's lifecycle.

Perhaps the most daunting roadblock to an efficient release process is the act of making changes to products in production. All changes made to a product design after it reaches production must be carefully weighed and precisely managed. The timing of when each change will take effect in production is absolutely critical, as the decision-maker must take into account multiple variables such as current raw material and inventory levels.

To complicate matters, design changes often require retooling and other manufacturing alterations that must be well-coordinated to meet the desired effective date for the change. In effect, release to manufacturing is the final step in a change management process, and if it is not optimized, it can seriously hamper an organization's ability to be responsive to customers and to quickly process change.

Every day issues associated with the release to manufacturing process:

Release to manufacturing processes touch many parts of the organization. Key stakeholders stand to gain significantly when these processes are optimized. For example, have you ever....

Engineering

- Had difficulty finding out current inventory or product cost information?
- Made incorrect design decisions based upon out of date manufacturing information?
- Been uncertain as to when and to whom information should be provided?

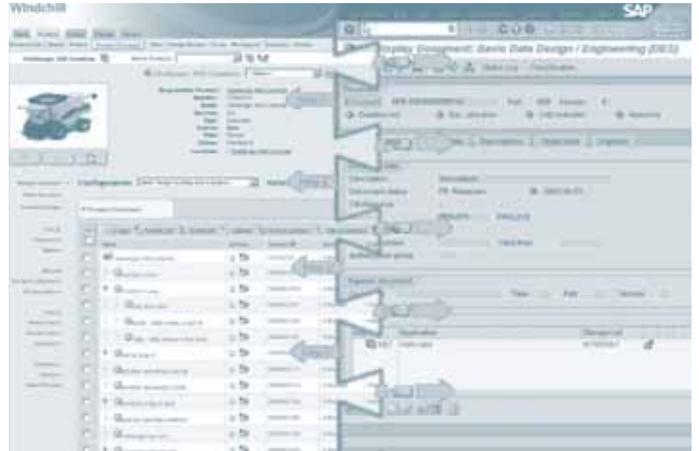


Figure 1: Module extending Windchill PDMLink ensures information synchronization with downstream systems, such as ERP.

Manufacturing

- Been given a 'released' package only to have critical missing information?
- Found errors due to manual re-entry of engineering data?
- Produced parts that have been replaced in engineering?

IT

- Had information duplicated in multiple systems, leading to questions around the 'correct' master?
- Created homegrown integrations that are not supported by vendors?
- Faced budget constraints to meet the high upgrade and maintenance costs of custom integrations?

Optimized RTM Process: Five Steps

This section provides a brief overview of the steps of the release to manufacturing process. Steps 1 through 3 closely parallel steps in the enterprise change process, and are intended as support activities to enable that process. The steps of the release to manufacturing process are typically executed at the same time as their corresponding process steps within the enterprise change process.

Step 1:

This first step involves the identification of a change that is in progress. The release to manufacturing process does not cover creation of changes, but does tie directly into the change process. Each engineering change notice (ECN) may result in a release of engineering information to production. Release to manufacturing yields the highest benefits to an organization when it is tied to the change process. This union ensures that information is shared with manufacturing at the right time in the change cycle, with the correct level of detail, and with proper authorization.

“Industries such as Automotive and Aerospace often have five to ten times the complexity in changes to manufacturing processes and tooling than to the design itself. Making the communication of these changes as seamless as possible ensures a smooth transition of engineering changes.”

–AMR Research

Step 2:

The second step supports the corresponding steps in the enterprise change management process. Specifically, it enables responsible parties to use production data from the ERP system to make more intelligent design decisions. For example, the engineer identifies affected and resulting parts upon which to base the investigation. The engineer then queries for manufacturing information such as part cost and quantity on hand. These two pieces of information are critical inputs to effectively assessing the scope, feasibility, and cost of the change. By making this manufacturing business information available to engineering, the release to manufacturing process is able to transform the engineer’s decision making process from a localized, design-centric one to something that is broader and more enterprise-focused.

Step 3:

In the third step, the engineer identifies existing production parts that must be changed. By using ERP information, such as effectivity, stock disposition, and substitutes, the engineer can make more intelligent decisions. Here again, by making critical manufacturing information available to the design engineer, the release to manufacturing process effectively empowers engineers to act in the best interests of the organization.

Step 4:

In the fourth step, the engineer assigns new parts to the correct manufacturing facilities, or makes changes in assignments to reflect changes in production locations. The engineer first determines where the product or assembly is to be produced depending on the life cycle of the product. This may entail one or more of the following:

- Finding out where an existing product is produced
- Deciding what new or different production facilities should be used for an existing product
- Deciding where a new product should be produced

For any of these tasks, the engineer may view existing assignments to aid the process and identify any differences between intended facilities and the actual assignments. The engineer then assigns manufacturing plants for each part that needs new or different plant assignments.

Step 5:

The final step covers the actual publication of change packages to ERP. In this step the responsible engineer or release analyst assigns new parts to the correct manufacturing facilities, or makes changes in assignments to reflect changes in production locations. Like many of the other steps in the release to manufacturing process, it has links to the enterprise change management business process.

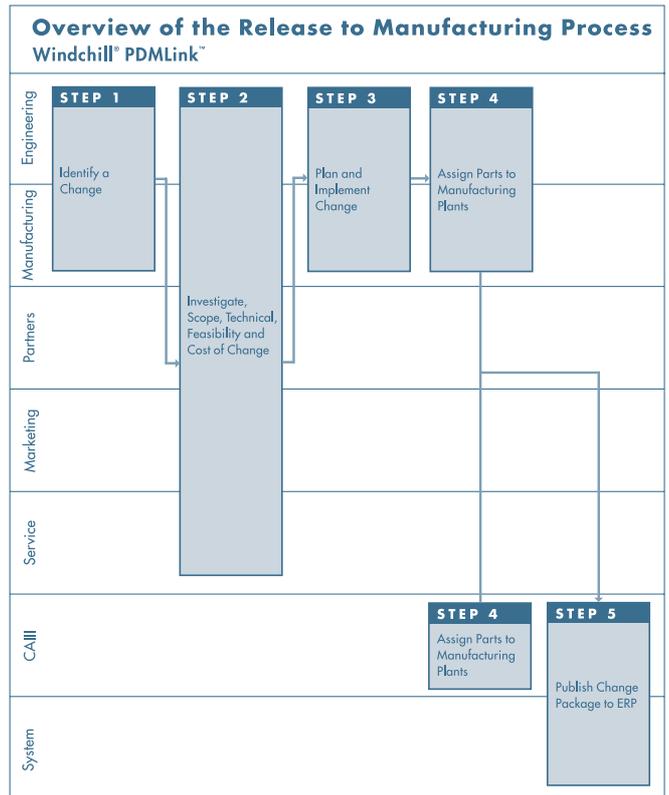


Figure 2: The five steps of the release to manufacturing process.

[NOTE: The RTM steps and their associated activities are described in far greater detail in the Product Development System Release to Manufacturing Business Process Guide. This guide describes recommended methods and techniques for optimizing the release to manufacturing process.]

Finally Making the Connection

Companies that are attacking the inefficiencies and outdated practices in the release to manufacturing process are seeing a number of important business benefits:

Reduced Overhead Costs

Eliminating the manual data-entry tasks in traditional release to manufacturing processes saves time, resources and related costs.

Lower Product Costs

Making information available across engineering and manufacturing early in the process reduces late-stage changes and related unnecessary rework. Providing engineering access to manufacturing part data reduces scrap and rework costs associated with engineering changes.

Shorter Time-to-Market

Providing an automated flow of information between systems speeds the transfer of data, eliminates errors due to manual tasks, and reduces the number of changes that delay product launches.

Higher Quality

Creating a seamless flow of information between engineering and manufacturing allows for better decision-making earlier in the design phase and ensures the product is more likely to be built right the first time.

The Solution: PTC's Product Development System

From globalize supply chains to increasing customer demands, the process of developing a winning product is more challenging than ever. PTC, the leading provider of Product Lifecycle Management (PLM) solutions, recognizes this challenge and has responded by developing PTC's Product Development System (PDS). PTC's PDS is a configuration of PTC solutions, specifically designed and tested together to give companies the three key capabilities necessary for successful product development:

- Create detailed and intuitive digital product information
- Collaborate to manage critical opportunities and engage project teams, customers, suppliers, and partners
- Control critical processes

PTC's Product Development System is the only solution proven to work seamlessly across all critical product development processes, including the release to manufacturing process.

PTC's PDS provides the connection that enables the release of digital product information from engineering to manufacturing, and ensures that members of the digital product value chain have accurate, real-time information exactly when they need it. This connection helps companies publish designs to manufacturing and then convert those designs into physical products in less time—with far less margin for error—and is essential to driving cost reductions and improved quality throughout the enterprise.

PTC has established partnerships with leading companies to create a set of release to manufacturing integrations that can help manufacturers streamline and optimize their release to manufacturing processes. Starting with integrations to SAP's and Oracle's ERP software, PTC has embarked on a path to provide a series of out-of-the-box integrations, all built on TIBCO, Inc.'s leading Enterprise Application Integration (EAI) technology.

As part of PTC's PDS, these integrations are preconfigured, so they support the exchange of common business objects and processes between engineering and manufacturing. This integration enables bi-directional flow of rich product information, which results in better product design decisions.

By automating the release to manufacturing process, PTC's PDS reduces the amount of manual work typically required by the release to manufacturing process. PTC has built the business logic that connects the release to manufacturing process to the change management process, which makes automation possible and results in improved product quality, customer responsiveness, and resource utilization.

Today, a single product such as an airplane, automobile, or other large assembly, is often released to manufacturing as a series of separate release 'packages'. If engineering is aware of manufacturing lead times and other constraints, they can prioritize and release portions of the product design to accommodate the needs of manufacturing.

The release to manufacturing process, when driven by PTC's PDS, enables this level of coordination and product planning. The process ensures that downstream systems always have the most current and accurate product information so that products meet their targeted launch date.

Another critical area in the release to manufacturing process is the ability to manage the many changes made to products over their lifetime. PTC's PDS and its release to manufacturing process facilitate the release of the change, and enable strategic planning for the timing of the change. Manufacturing is notified of pending changes and is able to adjust production schedules, processes, tooling, and inventory levels to prepare for the change.

PTC—Uniquely Qualified

Seamless release to manufacturing not only requires superior technology, it also requires the ability to understand how it impacts critical business processes and people in the organization. PTC's PDS delivers a combination of leading technology, process optimization, and proven adoption methods that can ensure a successful release to manufacturing initiative.

With the experience gained from working with more than 35,000 leading companies in a variety of manufacturing industries, PTC understands how to leverage technology appropriately to ensure full support for optimized processes that can be successfully implemented and adopted throughout your organization.

For More Information

To learn how to optimize your release to manufacturing process, call your local PTC sales representative to schedule an assessment or contact us to find a representative at www.ptc.com/company/contacts/index.htm.

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